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The project OffshoreWake will investigate and solve new issues in offshore wind resource estimation and the conversion to power calculation, arising from wake effects of wind farms as the number and size of offshore wind farms grow.

The focal point of OffshoreWake is to develop a calculation system that adds the large scale offshore wind farm wake (WFW) to wind-to-power calculation system. At the same time it is essential to consider the effects from a series of external factors, including varying weather conditions, stability and wave conditions.

The product of OffshoreWake will be a calculation system that contains five dynamically interacting components, the wind, the wake, the sea surface conditions, the wind-to-power conversion and the power system. The corresponding models for these components, with Weather Research and Forecasting (WRF) model for wind, Explicit Wake Parameterization (the EWP module in WRF) for wind farm wake, Spectral Wave model Nearshore (SWAN) for sea surface conditions, Corwind for the wind-to-power and Simba for power system. The novelty of OffshoreWake is the implementation of EWP and SWAN to the existing modeling system and improvement of the power conversion calculation.

The development of the calculation system is calibrated, verified and validated with measurements, including offshore masts, SCADA and satellite data. The system will eventually be applied to existing and future offshore wind farm layouts, resource and wind power assessment.